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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/715,275	11/17/2000	Jerchen Kuo	ALLOP-002	6576

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EXAMINER
HOANG, THAI D

ART UNIT	PAPER NUMBER
2662	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/715,275	Applicant(s) KUO ET AL.
	Examiner Thai D Hoang	Art Unit 2662

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *Amendment filed on 12 August 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-72* is/are pending in the application.

4a) Of the above claim(s) *15,16 and 18* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10,12-14,17,19,21-30,32-39,41-45,47-51,53-60 and 62-71* is/are rejected.

7)☒ Claim(s) *11,20,31,40,46,52,61 and 72* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 August 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1, 12, 17, 21, 41, 44, 62 are rejected under 35 U.S.C. 102(e) as being unpatentable over Graves et al, hereafter referred to as Graves.

1.1 Regarding claims 1, 12 and 21, Graves discloses an improved access system for use in a fiber-in-the-loop communication network. The system comprises:

an optical line terminal (host digital terminal; fig. 2B and 3B, element HDT) and

a plurality of optical network units (fig. 2B and 3B, elements ONU) connected to OLT by a passive optical network (element 30) in which downstream data is transmitted from OLT to ONU and upstream data is transmitted from ONUs to OLT over a passive optical network. Graves teaches that the OLT transmits downstream data over a passive optical network in variable length packets (fig. 2B, 3A-B; col. 12, lines 57-67;

col. 22, lines 42-49.); and the ONUs transmit upstream data over a passive optical network within ONU specific time slots utilizing time division multiplexing (fig. 2A and 3A), wherein ONU-specific time slots are filled with multiple variable length upstream packets (fig. 2B, 3A-B; col. 12, lines 57-67; col. 22, lines 42-49.)

1.2 Regarding claim 17, Graves discloses that the system transmitting downstream synchronization markers (fig. 2A and 3A, address field; col. 7, lines 20-24, and 52-55; col. 10, lines 38-41) at constant time intervals (125μs.)

1.3 Regarding claim 41, Graves teaches that the OLT transmits downstream data over a passive optical network in variable length packets (fig. 2A-3B, col. 12, lines 57-67; col. 22, lines 42-49); transmitting downstream synchronization markers (address field in fig. 2A and 3A; col. 7, lines 20-22 and lines 52-55, col. 10, lines 39-41) at constant time intervals (125μs); and the ONUs transmit upstream data over a passive optical network (30) within ONU specific time slots utilizing time division multiplexing (fig. 2A and 3A), wherein ONU-specific time slots are filled with multiple variable length upstream packets (fig. 2B, 3A-B; col. 12, lines 57-67; col. 22, lines 42-49.)

1.4 Regarding claim 44, Graves discloses that the ONU-specific time slots are filled with multiple variable length upstream packets (fig. 2B, 3A-B; col. 12, lines 57-67; col. 22, lines 42-49.)

1.5 Regarding claim 62, Graves discloses that the system comprises:

an optical line terminal (host digital terminal; fig. 2B and 3B, element HDT) and

a plurality of optical network units (fig. 2B and 3B, elements ONUs) connected to OLT by a passive optical network (element 30) in which downstream data is transmitted

from OLT to ONU and upstream data is transmitted from ONUs to OLT over a passive optical network. Graves teaches that an OLT transmits downstream data over a passive optical network in variable length packets (fig. 2B, 3A-B; col. 12, lines 57-67; col. 22, lines 42-49) and downstream synchronization marker (fig. 2B and 3B, address field; col. 7, lines 20-24, lines 52-55; col. 10, lines 38-41) at constant time intervals (fig. 2A, 3A; time interval 125μs); and the ONUs transmit upstream data over a passive optical network within ONU specific time slots utilizing time division multiplexing (fig. 2A and 3A), wherein ONU-specific time slots are filled with multiple variable length upstream packets (fig. 2B, 3A-B; col. 12, lines 57-67; col. 22, lines 42-49.)

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 2-10, 13-14, 19, 22-30, 32-39, 42-43, 45, 47-51, 53-60, 63-71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Graves.

2.1 Regarding claims 2, 5, 13, 22, 25, 33, 36, 42, 48, 54, 57, 63, and 66, Graves does not disclose that the variable length upstream and downstream packets are formatted according to IEEE 802.3 standard.

However, the family of IEEE 802.3 standard is a well-known standard, which is applied in many telecommunication systems in Networks.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt IEEE 802.3 standard into Graves's system for economic reasons since IEEE 802.3 is a widely used standard.

2.2 Regarding claims 3-4, 6-7, 14, 23-24, 26-27, 34-35, 37-38, 43, 49, 55-56, and 58-59, 64-65, and 67-68, Graves does not disclose that the lengths of the variable-length upstream and downstream packets include the lengths of an IP datagrams plus packet overhead. However, IP packets are well-known in the telecommunication field.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt IP packets into the system disclosed by Graves for economic reasons since IP is a widely used protocol in Networks.

2.3 Regarding claims 8, 28, 39, 60 and 69, Graves does not teach the variable length upstream and downstream packets are formatted according to IEEE 802.3 standard, and upstream and downstream data include IP datagrams.

The family of IEEE 802.3 standard and IP packet are well-known in the art, which are applied in many telecommunication systems.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt IEEE 802.3 standard and internet protocol into Graves's system for the same purpose as mentioned in paragraph 2.1.

2.4 Regarding claims 9, 29, and 70, Graves does not teach that the OLT includes a fragment buffer for storing packets transmitted from ONUs (upstream); and that the ONUs include fragment buffers for storing packets that are to be transmitted from ONUs.

However, buffering data is used in almost all communications equipments.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to add buffers to Graves's system in order to control data flow between ONUs and OLT.

2.5 Claims 10, 19, 30, 45, and 71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Graves in view of Keenan et al, US Patent No. 6,215,789 B1.

Regarding claims 10, 19, 30, 45, and 71, Graves does not discloses that the system comprises a fragment unit for splitting a variable-length upstream packet into first and second packet fragments; and adding an end-of-packet-fragment code to the first packet fragment and adding a start-of-packet-fragment code to the second packet fragment. However, this feature is disclosed in Keenan's invention (col. 10, lines 40-49.)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt the packet fragment method disclosed by Keenan into Graves' system in order to utilize the bandwidth of the system for transmission.

2.6 Regarding claim 32, Graves discloses an improves access system for use in a fiber-in-the-loop communication network, which comprises:

an optical line terminal (host digital terminal; fig. 2B and 3B, element HDT) and

a plurality of optical network units (fig. 2B and 3B, elements ONUs) connected to OLT by a passive optical network (element 30) in which downstream data is transmitted from OLT to ONU and upstream data is transmitted from ONUs to OLT over a passive optical network (30). Graves teaches that the OLT transmits downstream data over a passive optical network in variable length packets; and the ONUs transmit upstream

data over a passive optical network within ONU specific time slots utilizing time division multiplexing (fig. 2A and 3A; col. 6, lines 55-57), wherein ONU-specific time slots are filled with multiple variable length upstream packets (fig. 2B, 3A-B; col. 12, lines 57-67; col. 22, lines 42-49.)

Graves does not disclose that the OLT and ONU include fragment buffers. Also, Graves does not disclose that the system comprise a fragment unit for splitting a variable-length upstream packet into first and second packet fragments; and adding an end-of-packet-fragment code to the first packet fragment and adding a start-of-packet-fragment code to the second packet fragment. However, buffering data is used in almost all communications equipments. Furthermore, Keenan discloses fragment packet method as mentioned in paragraph 2.5.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to add buffers into Graves' system in order to control data flow between ONUs and OLT; and adapt the fragment method disclosed by Keenan into Graves' system in order to utilize the bandwidth of the system for transmission.

2.7 Regarding claim 47, Graves teaches that the OLT transmits downstream data over a passive optical network in variable length packets; and the ONUs transmit upstream data over a passive optical network within ONU specific time slots utilizing time division multiplexing (fig. 2A and 3A), wherein ONU-specific time slots are filled with multiple variable length upstream packets (fig. 2B, 3A-B; col. 12, lines 57-67; col. 22, lines 42-49.) Graves does not discloses that the system comprise a fragment unit for splitting a variable-length upstream packet into first and second packet fragments; and

adding an end-of-packet-fragment code to the first packet fragment and adding a start-of-packet-fragment code to the second packet fragment. However, this feature is disclosed in Keenan's invention (col. 10, lines 40-49.)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt the packet fragment method disclosed by Keenan into Graves' system for the same purpose as mentioned in paragraph 2.5.

2.8 Regarding claim 50, Graves discloses that the system transmitting downstream synchronization markers (fig. 2A and 3A, address field; col. 7, lines 20-24, and 52-55; col. 10, lines 38-41) at constant time intervals (125μs.)

2.9 Regarding claim 51, graves discloses that the ONU-specific time slots are filled with multiple variable length upstream packets (fig. 2B, 3A-B; col. 12, lines 57-67; col. 22, lines 42-49.)

2.10 Regarding claim 53, Graves discloses that the system comprises:

an optical line terminal (host digital terminal; fig. 2B and 3B, element HDT) and

a plurality of optical network units (fig. 2B and 3B, elements ONUs) connected to OLT by a passive optical network (element 30) in which downstream data is transmitted from OLT to ONU and upstream data is transmitted from ONUs to OLT over a passive optical network. Graves teaches that the OLT transmits downstream and upstream data over a passive optical network in variable length packets (fig. 2B, 3A-B; col. 12, lines 57-67; col. 22, lines 42-49.), therefore, Graves' system inherently comprises a means (processors 141) for formatting downstream and upstream data into variable length packets. Furthermore, Graves discloses that the ONUs transmit upstream data over a

passive optical network (30) within ONU specific time slots utilizing time division multiplexing (fig. 2A and 3A, col. 7, lines 48-55), in order to avoid collisions with upstream packets from other ONUs. Graves does not disclose that the OLT and ONU include fragment buffers. Also, Graves does not disclose that the system comprise a fragment unit for splitting a variable-length upstream packet into first and second packet fragments; and adding an end-of-packet-fragment code to the first packet fragment and adding a start-of-packet-fragment code to the second packet fragment. However, buffering data is used in almost all communications equipments. Furthermore, Keenan discloses fragment packet method as mentioned in paragraph 2.5.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to add buffers into Graves' system in order to control data flow between ONUs and OLT; and adapt the fragment method disclosed by Keenan into Graves' system for the same purpose as mentioned in paragraph 2.5.

Allowable Subject Matter

3. Claims 11, 20, 31, 40, 46, 52, 61, and 72 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

4. Applicant's arguments with respect to claims 11-14, 17 and 19-72 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patents are cited to further show the state of the art with respect to the application:

US patent No. 5,189,671 to Cheng

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thai D Hoang whose telephone number is (703) 305-3232. The examiner can normally be reached on Monday-Friday 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on (703) 305-4744. The fax phone numbers for the organization where this application or proceeding is assigned is (703) 872-9314 for regular communications and After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4700.

KWANG BIN YAO
PRIMARY EXAMINER

Thai Hoang
October 31, 2002

III. Claim Rejections Under 35 U.S.C.103

Claims 2-10, 13-14, 19, 22-30, 32-39, 42-43, 47-51, 53-60, and 63-71 were rejected under 35 U.S.C. 103(a) as being unpatentable over Graves. However, Graves was published March 6, 2001 whereas Applicants filed November 17, 2000 and therefore filed before Graves was published for Claim rejections under 35 U.S.C. 103 obviousness.

3.1 Claims 2, 5, 13, 22, 25, 33, 36, 42, 48, 54, 63, and 66

Claims 2, 5, 13, 22, 25, 33, 36, 42, 48, 54, 63, and 66 recite a system and method in which the variable-length packets are formatted according to IEEE 802.3. Regarding claims 2, 5, 13, 22, 25, 33, 36, 42, 48, 54, 63, and 66; Graves discloses a method and apparatus for synchronous ATM cells which are segmented and transported upstream and downstream between a HDT and ONU. The Office action states, "Graves does not disclose that the variable length upstream and downstream packets are formatted according to IEEE 802.3 standard. The Office action goes on to conclude that "[h]owever, the family of IEEE 802.3 standard is a well-known standard, which is applied in many telecommunication Networks," and "[i]t would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt IEEE 802.3 standard into Graves' system for economic reasons since IEEE 802.3 is widely used standard." (Office action page 4, item 2.1)

Applicants assert that claims 2, 5, 13, 22, 25, 33, 36, 42, 48, 54, 63, and 66 are not rendered obvious in view of Graves because Graves teaches away from modifying the system disclosed by Graves to utilize IEEE 802.3 formatted variable-length packets between the OLT and the ONUs. Graves discloses "Scenario B [which entails] Frame Relay (or similar packetized) service carried across an ATM core network is delivered to and from an end user as a Frame Relay service" (Graves, col. 11, lines 37 – 40) wherein "ATM cells arriving from the core network and carrying the Frame Relay service are routed by switch matrix to a first DSP. DSP is dedicated to the process of reassembling segments of Frame Relay packets contained within the ATM cell stream into pure Frame Relay packets." (Graves, col. 12, lines 57 – 62). Additionally, Scenario A of Graves is in the same format as Scenario B, as "In fact, the commonness of the data format communicated between the HDT and the ONUs (and vice versa) is an important property